

# Proposal Presentation

Imagine Design Engineer

By Aboo B S Fatally

# CUSTOMER

- Patients
- Relatives
- Visitors
- Adults
- Children
- Old and young



# STAKEHOLDERS

- Investors
- Health service providers
- Public hospitals
- Private hospitals
- Clinics
- Surgical centers

# Research

- A survey of designs yielded some to the materials to be included in the final product
- A cost analysis of materials and services to implement the design



# Point of View

- The patients need many services to meet the health problems
- The technician needs access for their interventions
- The radiologist needs to use using their portable tools.
- The laboratory technicians need specimens for assays.
- Nurses need to isolate patient for infection control.
- The physiotherapist needs room to get the patient moving.

# Problem Definition

- A working space that is accessible to teams with equipment and tools
  - A pleasant environment for the family and friends, children and old.
  - The possibility of handling 50 to 200 kg weight
  - Doors that beds could pass through
  - Lighting with user variable intensity and luminosity
- Negative pressure environment
  - Network hospital information system
  - Noise reduction material
  - Washable and durable surfaces
  - Excellent ergonomics
  - Low cost



# Criteria List

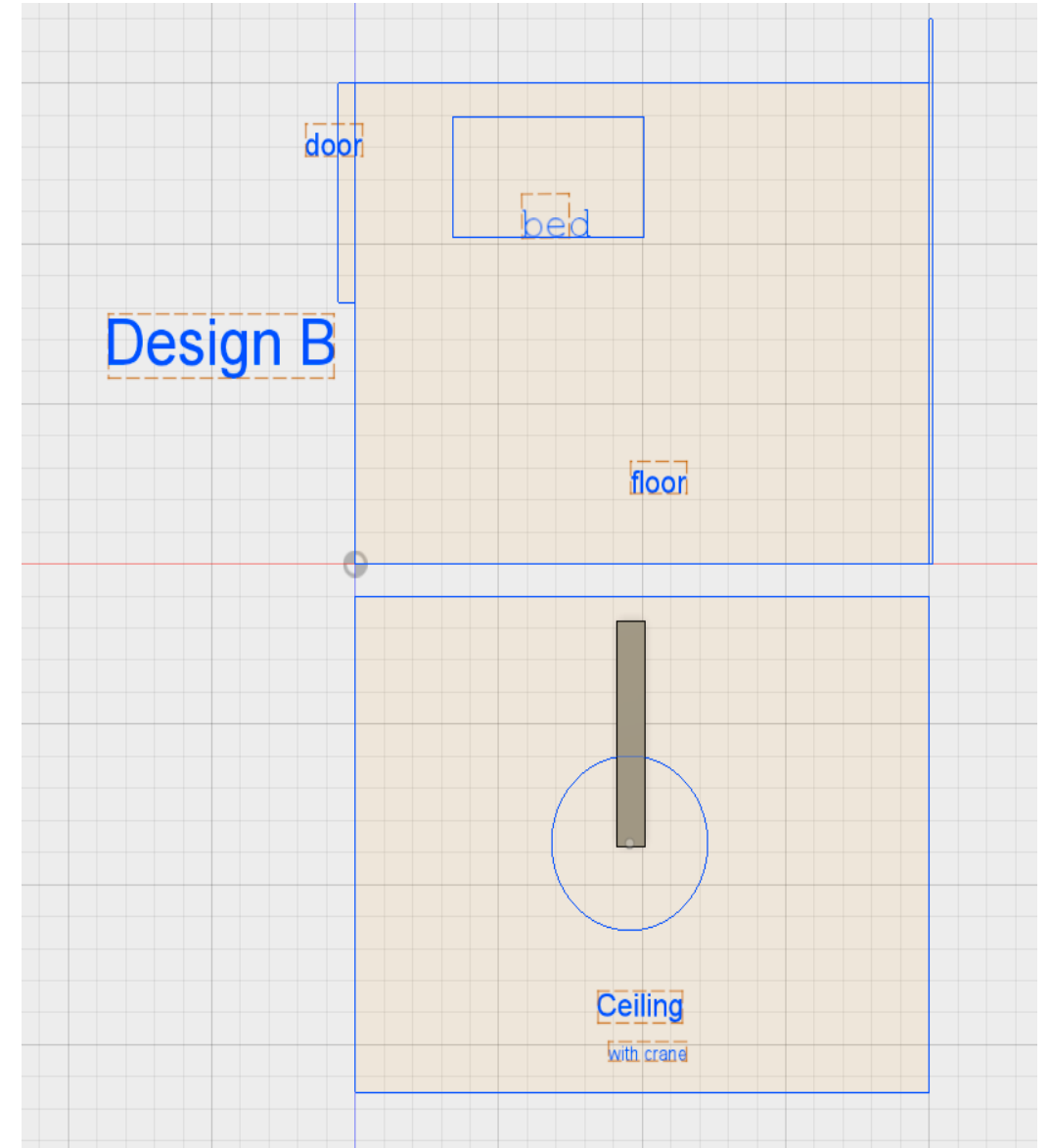
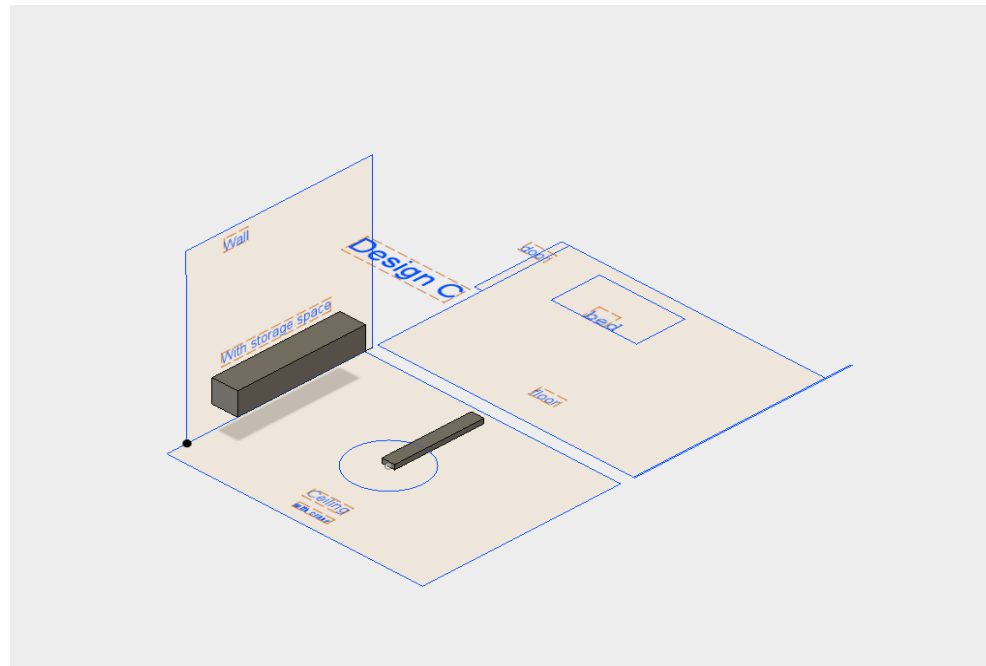
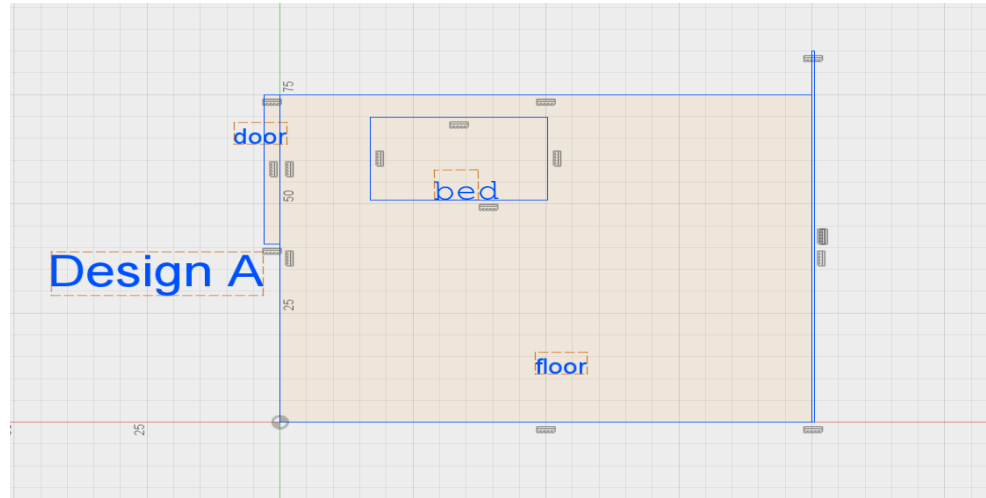
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	A	B	C	D	E	F	
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2		Criteria	1	2	3	4	
3	The teamwork that network efficiently.	1	1	2	9	7	
4	The equipment that are well calibrated.	2	1/2	1	9	9	
5	The ergonomics that enhance the use.	3	1/9	1/9	1	1/9	
6	The functions of the organization that are flexible and timely.	4	1/7	1/9	9	1	
7	The look of the environment that meet professionalism and appropriate.	5	1/8	1/9	4	1/2	
8	The feel of the furniture that satisfies the senses.	6	1/8	1/9	2	1/7	
9	The cost that the user and stakeholder are in agreement with	7	1/9	1/3	1/8	1	
10	The maintenance efficiency that keeps the system running well.	8	1/5	1/9	6	1	
11	The user friendliness that is appealing	9	1/7	1/3	1/8	1	
12	The Timeliness of service that meets all stakeholders.	10	1/6	1/8	1/4	1/3	
13	The spectrum of services that is wide and varied.	11	1/8	1/9	9	1/3	
14	The availability of options.	12	1/9	1/6	1/4	1/4	
15	The number and variety of tools	13	1/6	1/9	1/2	1/7	
16			2 1/252	3 4/9	34	17 95/126	2
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# A Decision Matrix for Designs A,B,C

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		Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13		Weight	Rating	score	Rating	Score	Rating	Score	
The teamwork that network efficiently.		1	1	2	9	7	8	8	9	5	1/7	6	8	9	6	78 1/7	0.290	6	1.7419	5	1.452	4	1.161	
The equipment that are well calibrated.		2	1/2	1	9	9	9	9	8	9	3	8	9	6	9	89 1/2	0.333	5	1.6625	7	2.328	3	0.998	
The ergonomics that enhance the use.		3	1/9	1/9	1	1/9	1/4	1/2	3	1/6	8	4	1/9	4	1	22 13/36	0.083	4	0.3323	3	0.249	6	0.498	
The functions of the organization that are flexible and timely.		4	1/7	1/9	9	1	2	7	5	1	1	3	3	4	7	36 16/63	0.135	3	0.4041	9	1.212	7	0.943	
The look of the environment that meet professionalism and appropriate		5	1/8	1/9	4	1/2	1	5	1/7	1/7	1	4	3	8	6	27 11/504	0.100	2	0.2008	5	0.502	3	0.301	
The feel of the furniture that satisfies the senses.		6	1/8	1/9	2	1/7	1/5	1	1	4	2	1/5	1/9	5	1/2	15 332/373	0.059	1	0.0590	6	0.354	3	0.177	
The cost that the user and stakeholder are in agreement with		7	1/9	1/3	1/8	1	7	1	1	4	9	8	4	6	5	41 41/72	0.154	1	0.1544	2	0.309	5	0.772	
The maintenance efficiency that keeps the system running well.		8	1/5	1/9	6	1	7	1/4	1/4	1	9	7	8	4	4	43 73/90	0.163	1	0.1628	4	0.651	7	1.139	
The user friendliness that is appealing		9	1/7	1/3	1/8	1	1	1/2	1/9	1/9	1	1/5	5	5	1/4	14 503/961	0.054	1	0.0540	6	0.324	9	0.486	
The Timeliness of service that meets all stakeholders.		10	1/6	1/8	1/4	1/3	1/4	5	1/8	1/7	5	1	1/4	6	1/7	18 9/14	0.069	1	0.0693	7	0.485	2	0.139	
The spectrum of services that is wide and varied.		11	1/8	1/9	9	1/3	1/3	9	1/4	1/8	1/5	4	1	6	3	30 43/90	0.113	1	0.1132	8	0.906	3	0.340	
The availability of options.		12	1/9	1/6	1/4	1/4	1/8	1/5	1/6	1/4	1/5	1/6	1/6	1	2	3 19/360	0.011	1	0.0113	4	0.045	6	0.068	
The number and variety of tools		13	1/6	1/9	1/2	1/7	1/6	2	1/5	1/4	4	7	1/3	1/2	1	15 53/143	0.057	1	0.0571	5	0.286	7	0.400	
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# Comparing designs A B C



# How the design is used

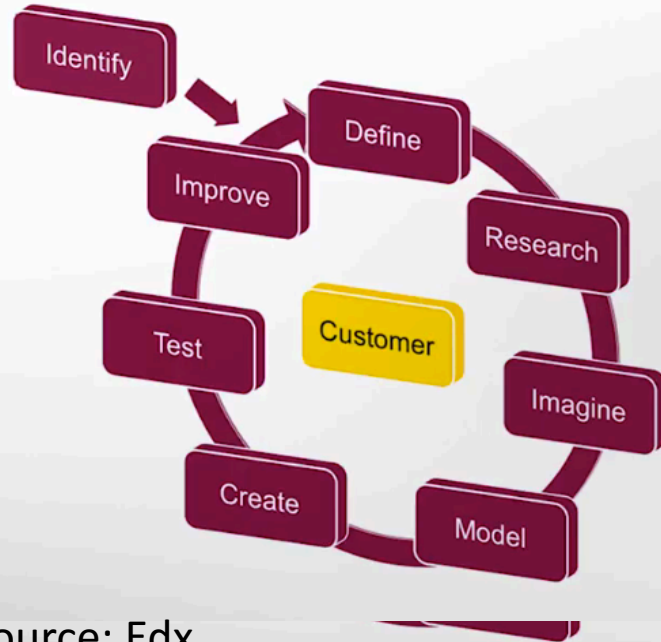
- This design functions:
  - User may be moved in different position
  - It provides the space necessary for multidisciplinary team interventions  
Radiology, Laboratory, Medical, Nursing and relatives and friends
  - The surfaces are easy to clean and maintain
  - The light are adequate with variable lumens
  - The environmental control are accessible and comfortable to use.

## How this design solves the problem as defined by the problem statement, requirements, and criteria

- The design includes wood, steel, aluminum, plastic, paints and textile materials
- The design meets the requirements of the customer
- It allows mobility
- It allows teams of professionals accessibility

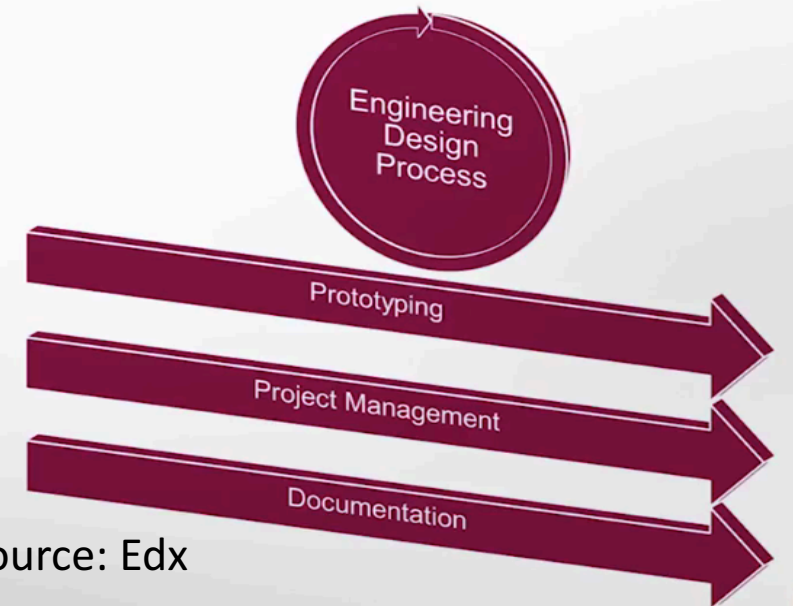
# LEARNING I

The Engineering Design Process



Source: Edx

The Engineering Design Process



Source: Edx

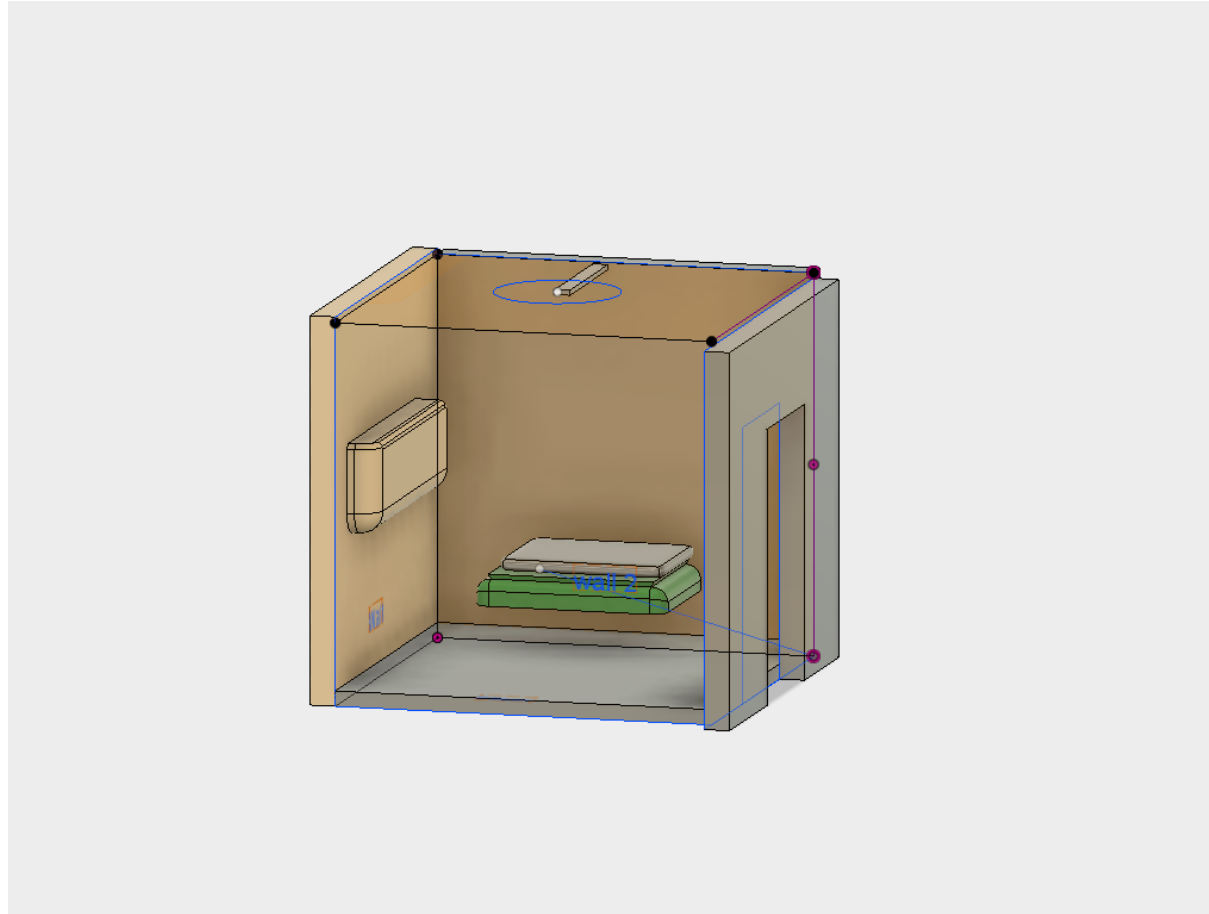
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## Decision matrix for Design A,B, C

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# Fusion 360 sketch



## Learning II

- ***The first step* is to identify a problem to solve.**
- Be curious, connect to customer values to meet their expectations.
- Plan, failing to plan is planning to fail
- Customer values are essential for the acceptance of the final design.

***The second step* is to formally define your problem.**

Exclude all solutions in the definition of the problem

One conversation at a time

Stay focus

The stakeholders wanted value for their money.

Their values are the basis of the design they want built in.



# Learning III

- ***The third step* is to imagine different kinds of solutions to the problem**
- any ideas is useful.
- doing the same thing over yield the same results
- Innovate
- Imagine
- gather ideas
- research
- brainstorm
- Use AHP to rank criteria
- Evaluate designs to chose what suits the customer's values.

***The fourth step* is to put multiple ideas into one design.**

Ideas that are values of the customer

A design may have properties like:

Wall

Space for rotating bed

Bed that goes through wide doors.

Bed will rollers

Storage space against the wall.

Ceiling mini crane for moving patients around the room.

Light with different lumens.

# Learning IV

- ***The fifth step* is to communicate the design.**
- field test the design
- gauge the customer reaction to the design
- Add any properties the customer may want to use fully the design.

# The Future

- If I were to become an engineer my focus shall be human society.
- A perfectly engineered society that take into accounts the built in code of human digital genetic coding to make a better community of people that will enhance capabilities for progress.